

branch, lest he find himself in the unenviable position of an impecunious Jack-of-all-trades, his long years of training largely wasted.

THE TODAYS AND THE TOMORROWS

We have heard it said that there are no more frontiers in America. But that refers to physical frontiers. In medicine, the frontiers are farther and farther beyond the horizon, giving lie to the lament that youth no longer has a chance. These are the tomorrows that are destined to become your glorious todays, for, as I have said, today is always the day of great achievements in medicine.

A PRAYER OF THE PHYSICIAN

In conclusion, I should like to recite the following "Prayer of the Physician," the author of which is unknown to me:

O God, I pray that I may have absolute intellectual honesty. Let others fumble, shuffle and evade, but let me, the physician, cleave to the clean truth, assume no knowledge I have not, and claim no skill I do not possess.

Cleanse me from all credulities, all fatuous enthusiasms, all stubbornness, vanities, egotism, prejudices, and whatever else may clog the sound processes of my mind. These be dirt: make my personality as aseptic as my instruments.

Give me heart, but let my feeling be such as shall come over me as an investment of power, to make my thoughts clear and cold as stars, and my hand skillful and strong as steel.

Deliver me from professionalism, so that I may be always human, and thus minister to sickly minds as well as to ailing bodies.

Give me a constant realization of my responsibility. People believe in me. Into my hands they lay their lives. Let me, of all men, be sober and walk in the fear of eternal justice. Let no culpable ignorance of mine, no neglect, nor love of ease, spoil the worth of my high calling.

Give me the joy of healing. I know how far short I am of being a good man, but make me a good doctor. Give me that love and eagerness and pride in my work, without which the practice of my profession will be fatal to me and to those under my care.

Give me a due and decent self-esteem that I may regard no man's occupation higher than mine—envying not the king upon his throne, so long as I am prime minister to the suffering.

Deliver me from playing at precedence: from hankering for praise and prominence: from sensitiveness, and all like forms of toxic selfishness.

Give me money: not so little that I cannot have the leisure I need to put quality into my service; not so much that I shall grow fat in head and leaden in heart, and sell my sense of ministry for the flesh-pots of indulgence.

Give me courage, but hold me back from overconfidence.

Let me so discharge the duties of my office that I shall not be ashamed to look any man or woman in the face. Grant that when, at death, I lay down my task, I shall go to what judgment awaits me, strong in the consciousness that I have done something towards alleviating the incurable tragedy of life. Amen.

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ENDOCRINOLOGY: A CRITICAL APPRAISAL*

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PART I

IT is impossible to include in a single paper of reasonable length a complete review of all that is known of the endocrine glands; it will be necessary to deal briefly with some of them. An effort will be made to emphasize facts and to acknowledge assumptions. The cold hard truth is that few facts are known about some of the endocrine glands; why not admit it? Why must some pseudo-pharmaceutical firms give the impression in their pseudoscientific publications that endocrinology is an exact science and that administration of their preparations will effect a cure? For example, let it be stated that there is no good evidence that the oral administration of any anterior pituitary substance ever helped any patient in any way, except, perhaps, through the medium of suggestion. Why not acknowledge that much of the "endocrine therapy for glandular imbalance" is entirely worthless? Furthermore, let us as members of the medical profession be honest enough to admit that with recent advances in chemotherapy some of the material placed at our disposal may, if improperly used, be definitely harmful.

These intemperate remarks are not meant to reflect doubt on the excellent work being conducted by well-trained men; nor do they refer to the excellence of most of the articles appearing in established publications. They constitute, rather, an appeal that we, as physicians, utilize our powers of discrimination in separating the good from the bad, the true from the false. Let us be honest with ourselves and our patients by admitting our own incomplete knowledge; honesty is preferable to omniscience.

While no claim will be made to completeness, the following is an effort to list some of the accepted facts regarding the endocrine glands. Space prevents detailed discussion of any of them and some will be dealt with in a most cursory fashion.

THE THYROID

This gland and the syndromes which result from either its hyperfunction or its hypofunction are well recognized and, for the most part, are well treated. The treatment of choice for all adenomatous goiters with or without hyperthyroidism and for all cases of exophthalmic goiter is the surgical resection of the offending gland. Results of no other treatment can compare with the good results which follow the skillful surgical removal of a goiter. It should be added that all adenomatous goiters without hyperthyroidism should be removed, for many of these become active some time during the individual's life and virtually every case of carcinoma of the thyroid has its origin in an

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"innocent" adenoma. Deaths from thyroid disease now are occurring largely in cases in which a goiter has been neglected. The patient may have assumed the responsibility of permitting the goiter to remain or he may have been told "don't bother anything which isn't bothering you." In another group of cases in which death from goiter may occur, an effort has been made to treat the hyperfunction with the prolonged use of Lugol's solution. Lugol's solution should rarely be given to any patient with a goiter unless the patient has the distinct understanding that this treatment is simply a form of preoperative preparation and consents to proceeding with the thyroidectomy as soon as the ultimate improvement has been effected. The simple colloid enlargement of adolescent children is an exception to these remarks.

In its most marked state the underfunction of the thyroid produces the syndrome of myxedema, a condition which should be easily recognized and which responds satisfactorily to the judicious use of thyroid extract. For every patient with true myxedema, however, there are one hundred patients who have a low basal metabolic rate without myxedema, and in many instances the low basal metabolic rate is a part of their general clinical picture rather than the cause of their trouble. Raising the basal metabolic rate of individuals who do not have myxedema may or may not produce any clinical signs of improvement. Most patients with myxedema are completely relieved of all symptoms with a daily dosage of 2 grains or less (0.13 gram) of desiccated thyroid extract; many patients with low basal metabolic rates without myxedema require two or three times this amount, and then their symptoms may not be relieved.

THE PARATHYROID

Parathyroid Deficiency.

Parathyroid insufficiency usually follows the surgical removal of, or damage to, the parathyroid glands; it occurs following thyroidectomy in about .05 per cent of the cases. There are also a few instances of spontaneous hypoparathyroidism. The treatment of parathyroid insufficiency is quite satisfactory. Most of the patients respond very well to the use of calcium by mouth, the most inexpensive form of which is calcium lactate. Calcium lactate is effective only when it is in complete solution, and this can be accomplished only by dissolving it in very hot water. The amount of calcium lactate required varies with the degree of calcium deficiency; the condition of one patient may be well controlled with four teaspoonfuls a day and that of others during the acute stage may require twenty teaspoonfuls or more. Absorption of the calcium is aided by the addition of vitamin D, which can be administered most cheaply and easily in the form of cod-liver oil. It may be necessary on rare occasions to administer calcium intravenously; this can be given in the form of calcium gluconate (10 cubic centimeters of a 10 per cent solution). Dihydratichysterol (A. T. 10) has a very powerful effect in raising the blood calcium. It is given by mouth in an average dosage of one cubic centi-

meter every other day. The greatest drawback to its administration is its expense. It is rarely necessary to use parathyroid hormone.

Hyperparathyroidism.

Most of the symptoms of hyperparathyroidism relate to disturbances in the metabolism of calcium and phosphorus. The underlying physiologic principles are not completely understood, but present knowledge indicates that the hormone of the parathyroid glands is concerned with regulation of the serum calcium and phosphorus, whereas vitamin D controls the absorption of calcium from the intestine. The parathyroid hormone seemingly causes an increase in the activity of phosphatase, which is an enzyme found primarily in the osteoclast cells of bone, in periosteal cells and in the small bowel. The increased activity of this enzyme causes direct removal of calcium from the bones and thus the serum calcium is elevated. Albright¹ has emphasized that the serum calcium exists in two forms, the ionized form and that bound with protein. If disease has increased the quantity of the ionized form, and if the serum protein is decreased, it can readily be seen that the total value for serum calcium might be considered to be normal, whereas actually it is increased. For this reason, determinations of serum protein should be made in borderline cases, and if found to be low an upward correction must be made in the value for calcium. This probably explains why some patients with hyperparathyroidism are reported to have normal blood calcium.

Symptoms.—In considering the symptomatology of this condition, emphasis must be placed on the extreme variation of the symptoms in different stages of the disease and among different patients. Shelling² has classified the symptoms as follows:

"1. General:

- (a) Weakness
- (b) Loss of appetite
- (c) Loss of weight
- (d) Muscle and joint pains
- (e) Constipation and abdominal pain
- (f) Bradycardia and cardiac irregularities
- (g) Polydipsia
- (h) Hypochromic anemia

"2. Skeletal:

- (a) Generalized decalcification
- (b) Cysts and giant-cell tumors
- (c) Fractures
- (d) Lumps
- (e) Skeletal deformities and shortenings
- (f) Epulides

"3. Urinary:

- (a) Polyuria
- (b) Albuminuria
- (c) Dysuria
- (d) Hematuria
- (e) Milky urine or gravel
- (f) Renal, ureteral, or vesical calculi
- (g) Renal colic
- (h) Diminished renal function
- (i) Nephrocalcinosis

"4. Metastatic:

- (a) Arterial calcification
- (b) Broncholithiasis and pulmonary calcinosis
- (c) Generalized calcinosis

"5. *Metabolic and Chemical:*

- (a) Hypercalcemia
- (b) Hypophosphatemia
- (c) Hypercalciuria
- (d) Hyperphosphaturia
- (e) Increase in serum or plasma phosphatase"

The general symptoms are, of course, the opposite of those seen in cases of hypoparathyroidism: muscular weakness, atony and diminished response to stimuli, in contradistinction to the tetany and exaggerated response to stimuli (Chvostek's and Trousseau's signs) as seen in hypoparathyroidism.

The skeletal symptoms are those which follow decalcification and cystic changes in the bones. The urinary and metastatic symptoms are the result of the increased transportation and excretion of calcium with abnormal calcium deposition.

Diagnosis.—The diagnosis would be easy if each patient had definite symptoms of each of the types mentioned in the foregoing paragraph. Occasionally, a patient is seen who complains of weakness, atony, aching in bones and joints, who has noted a decrease in his height and has had changes in his bones, perhaps even one or more spontaneous fractures, who has suffered from hematuria and nephrolithiasis, whose roentgenograms reveal typical osteitis fibrosa cystica, chemical studies on whole blood reveal a high concentration of serum calcium and phosphatase and low value for serum phosphorus, and who has an easily palpable parathyroid tumor. Such cases are not the rule, nor is it desirable to wait until this condition develops before making the diagnosis.

Albright, Sulkowitch, and Bloomberg^{3,4} have discussed the methods used to diagnose the condition among patients who have a minimal degree of hyperparathyroidism. Twenty-two of their thirty-five patients were not suspected of having the disease when they entered the Massachusetts General Hospital, and the diagnosis was made in twelve cases in which characteristic changes in bone were not present and in eight cases in which only a moderate degree of hyperparathyroidism was present. They concluded:

"The presence or absence of bone disease is not a function of the degree of hyperparathyroidism, some of the severe cases not having it, some of the mild ones having it. Patients with bone disease and high serum phosphatase levels as a rule develop postoperative hypocalcemia; other cases seldom do.

"The term 'borderline' has been applied to mild cases of hyperparathyroidism and refers to the degree of hyperparathyroidism, not to the symptoms. In the diagnosis of such cases, the following points may be important:

"(a) The serum protein determination, so that allowance can be made for the bound calcium in interpreting the total calcium value.

"(b) A persistently low serum phosphorus level.

"(c) The calcium excretion in the urine.

"(d) The composition of the stone.

"(e) Repeated blood determinations."

An inexpensive, simple test to determine the excessive secretion of calcium in the urine has long been needed for use in the diagnosis of hyperpara-

thyroidism. Such a test has been developed by Sulkowitch. His reagent consists of 2.5 grams of oxalic acid, 2.5 grams of ammonium oxalate, and 5 cubic centimeters of glacial acetic acid dissolved in distilled water and made up to a volume of 150 cubic centimeters. He stated: "The Sulkowitch reagent is a solution containing oxalate radicals buffered at such a pH that when equal amounts of the reagent are added to urine the calcium will almost immediately come down as a fine white precipitate of calcium oxalate. If there is no precipitate there is no calcium, and the serum calcium level is probably from 5 to 7.5 milligrams per 100 cubic centimeters. If there is a fine white cloud, there is a moderate amount of calcium and the level of calcium in the serum is in the satisfactory range. If the precipitate looks like milk, the danger of hypercalcemia is present."

Space prevents complete consideration of the roentgenographic changes associated with hyperparathyroidism. Camp⁵ has emphasized the importance of the uniform, miliary, granular osteoporosis and stated that this mottled atrophy is distinct from the ordinary type seen in the case of osteoporosis, and it is found only in cases of hyperparathyroidism. In some regions, decalcification progresses to produce multiple cystic regions of varying size. Cysts may reach a large size and become the site of pathologic fractures. Because of the softness of the bones, bowing kyphosis, narrowing of the pelvis and coxa vara are common.

Treatment.—Once the diagnosis has been established, operation is the treatment of choice. If a tumor is found and is removed, the condition is relieved. In some cases, as is to be expected, a tumor is not found, but hypertrophy or hyperplasia is present and resection is indicated.

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(To be concluded)

The possibility of utilizing the general hospital as an effective medium for case-finding in tuberculosis has not been sufficiently explored. The fact that a person is admitted to a general hospital for a condition other than tuberculosis should never be accepted as a guarantee that such person does not have significant tuberculous disease. In a study of 4,853 adult admissions to fourteen general hospitals in New York State, 1.1 per cent showed clinically significant tuberculosis and 0.6 per cent unsuspected tuberculosis.—R. E. Plunkett, M. D., and Edward X. Mikol, *American Review of Tuberculosis*, March, 1940.